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NOVEMBER 29, 2010

Incentivizing Energy Efficiency across the American Economy

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Three major sectors of the American economy—industrial, residential, and commercial—are ripe for tremendous energy savings. McKinsey & Company estimates[1] that by 2020, capturing the economy's full efficiency potential will save $442 billion in energy costs and 300 megatons of CO2e in the industrial sector; $395 billion and 360 megatons of CO2e in the residential sector; and $290 billion and 360 megatons of CO2e in the commercial sector. The total possible savings in energy costs and greenhouse gas emissions are staggering: more than $1.1 trillion and 1,020 megatons of CO2e by the end of this decade.

Moreover, efforts at capturing energy efficiency potential could ripple extensively across the rest of the economy. McKinsey estimates that a $290 billion investment in labor-intensive efficiency measures could create between 500,000 and 750,000 jobs over the next decade. The Center for American Progress makes a similar estimation,[2] suggesting that retrofitting just 40% of all commercial and residential buildings in the United States would produce 625,000 jobs over the next decade and $500 billion in investment to upgrade 50 million office buildings and homes. And these statistics do not include new jobs and markets created by the development of next-generation energy-efficient technologies and industries.

Such figures are impressive, but they come with a cost. An estimated $113 billion in upfront investment is needed for the industrial sector to realize its total energy efficiency potential: $229 billion for residential and $125 billion for commercial.[3] Such upfront costs erect significant present-day barriers to greater energy efficiency, even if they eventually lead to sizable returns on investment. Many industrial, residential, and commercial consumers don't have enough free capital to invest in efficiency upgrades, aren't aware that such upgrades are possible and can generate significant savings, or are hesitant to assume the potentially high transaction costs in implementing energy efficiency measures—particularly in the industrial sector, where upgrades may cause interruptions in production.

Overcoming these barriers is one of the great challenges facing each sector, but consumers need not confront them alone. Federal policymakers have at their disposal a wide range of options that can act as powerful drivers of energy efficiency. Even if, as is likely, the economy's full efficiency potential is never captured, jumpstarting the transition to a more energy-efficient society will require a concerted national effort. Strategic government action is often the crucial spark for economic innovation: from the creation of the transcontinental railroads and interstate highways, to the Apollo Space Program and the Internet, government action has been an essential driver of change. The growing effort to transform the way we generate and use energy—one with the potential to reshape our economic and social landscape—is a challenge on par with sending a man to the moon. Energy efficiency, often regarded as "the lowest-hanging fruit" (or "fruit on the ground," as Energy Secretary Chu likes to say), is an ideal place to begin. Government must assume a leadership role.

To that end, we analyzed a variety of steps the federal government can take to promote greater energy efficiency, and identified policies we think fulfill three key purposes: (1) mitigating the upfront costs each sector must bear to realize energy efficiency savings and curb greenhouse gas emissions, (2) incentivizing the research and development of new energy-efficient technologies, and (3) educating end-use energy consumers on the virtues of greater efficiency. These policies are just a sampling of a broader set of options, but are considered particularly worthy of attention. The ultimate tool for driving greater efficiency—a price on carbon—is not included because its chance of enactment is, at least for the foreseeable future, almost nonexistent. While no argument is made about an ideal policy mix, some combination of ideas from the three major categories (Direct Financing; Tax Incentives; Codes, Standards, and Mandates) can amount to a fairly comprehensive approach.

Direct Financing

- Establish a dedicated Advanced Research Projects Agency – Energy (ARPA-E) energy-efficiency grant program to drive innovation among companies developing next-generation energy-saving technology and equipment (including smart grid technology). ARPA-E's funding also should be increased dramatically from its current level of $300 million. The vast, multitrillion dollar scale of the energy industry means ARPA-E needs higher funding levels if its initiatives are to have any impact on energy innovation.[4]

- Enact the HOME STAR Program included in legislation currently pending before Congress (S. 3663, the Clean Energy Jobs and Oil Company Accountability Act). The HOME STAR initiative establishes a $6 billion rebate program to drive residential investment in energy-efficient appliances, building mechanical systems and insulation, and whole-home energy efficiency retrofits.

- Establish an Industrial Energy Efficiency Revolving Loan Program (or similar refundable financing mechanism) with maximum financial incentives going to upgrades of industrial processes (e.g., blast furnaces in iron and steel manufacturing) and support systems (e.g., steam systems, motors, building infrastructure, energy management tools).[5] Such upgrades are relatively rare because of the large upfront cost involved in installing new technologies and equipment, the perceived risks of early adoption, and concerns over interrupted production. Direct financial incentives may help address these issues.

- Establish a dedicated Department of Energy (DOE) or Environemtal Protection Agency (EPA) grant program for the installation of combined heat and power (CHP) capacity, from large-scale power facilities to smaller on-site units, such as those in commercial buildings, factories, or apartment complexes. CHP technologies that are especially efficient and low-emission, like microturbines, would receive funding priority. It is estimated that an increase in total CHP power from 85 GW in 2008 to 135 GW in 2020 can cut facility-level energy costs by $77 billion and greenhouse gas emissions by 100 megatons of CO2e.[6]

- Create a Clean Energy Deployment Administration (CEDA)[7] that can finance innovative efficiency projects—in addition to various other energy projects—and provide sustained streams of capital investment for residential, commercial, and industrial energy efficiency retrofits.[8] Such a "Green Bank" would be one of the major driving forces of a deeper federal investment agenda in clean energy and energy efficiency.

Tax Incentives

- Create a tax credit for utilities, municipal power companies, and electric co-ops that provide support services and incentives to residential, commercial, and industrial customers who install energy-saving technologies and adopt energy-efficient measures. Utilities are in a powerful position to educate customers on the benefits of energy

efficiency, and can potentially drive behavioral change and cement energy efficiency as a social norm.

- Revamp the existing Energy-Efficient Commercial Buildings Tax Deduction (26 USCS 179D, as amended by the Energy Improvement and Extension Act of 2008) so it is made permanent, increases the level of financial incentives for efficiency upgrades, expands the scope of qualifying energy-efficient improvements (to include energy management tools, among other improvements) and adheres to the most stringent efficiency standards.
- Renew, expand (to $5 billion at a minimum) and make refundable the 48C Advanced Energy Manufacturing Tax Credit (26 USCS § 48C). 48C encompasses manufacturing facilities that produce energy-saving equipment and technologies.

Codes, Standards, and Mandates

- Phase in, over the course of several years, more stringent energy-efficient building codes for new and existing residential, commercial, and industrial buildings. Residences as well as commercial and industrial buildings can be modeled on standards set by organizations like the U.S. Green Building Council (USGBC); International Energy Conservation Code (IECC); or American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). Stricter codes will drive property owners and developers to purchase and utilize energy-saving technologies and engage in concerted retrofitting efforts, spurring demand for such technologies and services across the economy.[9]
- Expand the ENERGY STAR voluntary standards and labeling programs to include more residential, commercial, and industrial subsectors, appliances, and systems. The ENERGY STAR labeling program has had some success as a means of educating end-use energy consumers on the virtues of efficiency, but its scope could be broadened considerably. Only 2% of existing homes, for example, have had an energy assessment performed to determine possible energy savings, although ENERGY STAR did capture 17% of new construction in 2008 and an estimated 25% in 2009.[10]
- Establish a national Renewable Electricity Standard (RES) that requires utilities to obtain an increasing percentage of their base quantity of electricity from renewable energy and energy efficiency.[11] A majority of states now boast an RES that includes energy efficiency measures. Alternatively, the federal government could create an Energy Efficiency Resource Standard (EERS) that sets energy reduction targets—broken down by economic sector, industry, and utilities—to be met within a certain timeframe.

Endnotes

1 “Unlocking Energy Efficiency in the U.S. Economy,” *McKinsey & Company*, July 2009.

2 “Efficiency Works: Creating Good Jobs and New Markets through Energy Efficiency,” *Center for American Progress*, September 2010.

3 “Unlocking Energy Efficiency in the U.S. Economy,” *McKinsey & Company*, July 2009.

4 “Post-Partisan Power,” *American Enterprise Institute, Brookings Institute, Breakthrough Institute,* October 2010. AEI, Brookings, and Breakthrough also call for the development of “energy innovation” clusters around the country, supported with federal financing, to develop cutting-edge energy technologies.

5 Similar to the State Partnership Industrial Energy Efficiency Revolving Loan Program proposed in S. 1462, the American Clean Energy Leadership Act (ACELA).

6 “Unlocking Energy Efficiency in the U.S. Economy,” *McKinsey & Company*, July 2009.

7 Similar to the CEDA proposed in S. 1462.

8 “Efficiency Works: Creating Good Jobs and New Markets through Energy Efficiency,” *Center for American Progress*, September 2010.

9 “Efficiency Works: Creating Good Jobs and New Markets through Energy Efficiency,” *Center for American Progress*, September 2010.

10 Residential consumers chronically underestimate how much money they can save from retrofitting their current homes. Taken in conjunction with increasing ENERGY STAR penetration into the new homes market, these figures suggest that residential consumers consider energy efficiency a worthwhile investment only when building a new home. Overcoming this perception requires educating consumers on the value and potential savings of retrofitting an existing home, in addition to providing incentives for efficiency upgrades (such as those in the proposed HOME STAR program).

11 Similar to the RES proposed in S. 1462 and Sen. Bingaman’s recently proposed standalone RES legislation.

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